Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original) An apparatus for imparting motion from at least one of a plurality of motion sources into linear, rotary, or combined linear and rotary motion of an elongated device, the apparatus comprising:

a transmission for translating the motion to linear or rotary motion of the elongated device.

2. (Original) The apparatus of claim 1 where the external motion source is a motor.

3. (Original) The apparatus of claim 2 further comprising:

a controller electrically connected via drive circuitry to the motor and receiving positioning commands from an individual or machine;

a position feedback sensor measuring movement of the drive mechanism;

wherein motion of the elongated device is controlled by a closed control loop comprising the controller driving the motor and the sensor providing feedback about the elongated device motion to the controller.

4. (Original) The apparatus of claim 1 wherein the elongated device is a medical device.

5. (Original) The apparatus of claim 1 wherein the elongated device is a guide wire.

6. (Original) The apparatus of claim 1 wherein the elongated device is a catheter.

7. (Previously Presented) A transmission apparatus for imparting linear, rotary, or combined linear and rotary motion to an elongated device, the apparatus comprising:

a first main gear rotationally attached to a support and capable of being driven by a first drive;

a second main gear coaxially and rotationally attached to the first main gear, the second main gear geared to a roller drive gear and capable of being driven by a second drive;

a linear drive in which the elongated device may be engaged along an axis of the elongated device's rotation, the linear drive coupled to the first main gear, such that when the first main gear is rotated, the elongated device is rotated about the elongated device's axis of rotation, the linear drive being geared to the roller drive gear, such that when the second main gear is rotated the linear drive imparts linear motion to the elongated device.

8. (Original) The apparatus of claim 7, wherein the first drive and the second drive transmit power to the first main gear and the second main gear respectively via drive screws.

9. (Original) The apparatus of claim 7, wherein the first drive and the second drive are motors.

10. (Original) The apparatus of claim 7, wherein the first main gear and the second main gear are each provided with a slot to enable lateral insertion or removal of the elongated device.

11. (Original) The apparatus of claim 10, wherein the first drive and the second drive are provided with a position tracking mechanism so as to allow automated alignment of the slots for insertion or removal of the elongated device.

12. (Original) The apparatus of claim 7, wherein the linear drive comprises two geared rollers that are geared to the second main gear.

13. (Original) The apparatus of claim 12, wherein the two geared rollers resiliently grip the elongated device, and may be separated in order to insert or remove the elongated device.

14. (Original) The apparatus of claim 7, wherein a first position sensor measures the position of the first drive and a second position sensor measures the position of the second drive, whereby an open control loop can be applied to the operation of the first and second drives.

15. (Original) The apparatus of claim 13, wherein the two geared rollers are connected to a linear position sensor, whereby the actual movement of the elongated device is measured, whereby a closed control loop comprising the actual position of the elongated device from the linear position sensor and the first and second drive positions from the first and second position sensors.

16. (Original) The apparatus of claim 7 wherein the elongated device is a medical device.

17. (Original) The apparatus of claim 7 wherein the elongated device is a guide wire.

18. (Original) The apparatus of claim 7 wherein the elongated device is a catheter.

19. (Previously Presented) A transmission apparatus for imparting linear, rotary, or combined linear and rotary motion to an elongated device, the apparatus comprising:

a main gear rotationally attached to a support and capable of being driven by a first drive;

a linear drive in which the elongated device may be engaged along an axis of the elongated device's rotation, the linear drive coupled to the first main gear, such that when the first main gear is rotated, the elongated device is rotated about the elongated device's axis of rotation, the linear drive being geared to a second drive to impart linear motion to the elongated device.

20. (Original) The apparatus of claim 19, wherein the first drive and the second drive are motors.

21. (Original) The apparatus of claim 19, wherein the main gear is provided with a slot to enable lateral insertion or removal of the elongated device.

22. (Original) The apparatus of claim 21, wherein the first drive and the second drive are provided with a position tracking mechanism so as to allow automated alignment of the slot and the linear drive for insertion or removal of the elongated device.

23. (Original) The apparatus of claim 19, wherein the linear drive comprises two geared rollers.

24. (Original) The apparatus of claim 23, wherein the two geared rollers resiliently grip the elongated device, and may be separated in order to insert or remove the elongated device.

25. (Original) The apparatus of claim 19, wherein a first position sensor measures the position of the first drive and a second position sensor measures the position of the second drive, whereby an open control loop can be applied to the operation of the first and second drives.

26. (Previously Presented) The apparatus of claim 25, wherein the two geared rollers are connected to a linear position sensor, whereby the actual movement of the elongated device is measured, whereby a closed control loop comprising the actual position of the elongated device from the linear position sensor and the first and second drive positions from the first and second position sensors.

27. (Original) The apparatus of claim 19 wherein the first drive comprises a motor that imparts rotational force to a first drive roller that both imparts rotational force to the main gear and imparts rotational force via a translation roller to a second drive roller that also imparts force to the main gear.

28. (Withdrawn) The apparatus of claim 19 wherein the second drive is a motor that is driven by an internal source and controlled via wireless means.

29. (Withdrawn) The apparatus of claim 19 wherein the second drive is a that is driven by power from a coil on the main gear that is in contact with brushes on the base.

30. (Original) The apparatus of claim 19 wherein the elongated device is a medical device.

31. (Original) The apparatus of claim 19 wherein the elongated device is a guide wire.

32. (Original) The apparatus of claim 19 wherein the elongated device is a catheter.

33. (Original) A method for imparting linear, rotary, or combined linear and rotary motion to an elongated device, the method comprising:

rotating a first main gear rotationally attached to a support and capable of being driven by a first drive;

rotating a second main gear coaxially and rotationally attached to the first main gear, the second main gear geared to a roller drive gear and capable of being driven by a second drive;

engaging the elongated device along an axis of the elongated device's rotation in a linear drive, the linear drive coupled to the first main gear, such that when the first main gear is rotated, the elongated device is rotated about the elongated device's axis of rotation, the linear drive being geared to the roller drive gear, such that when the second main gear is rotated the linear drive imparts linear motion to the elongated device.

34. (Original) A method for imparting linear, rotary, or combined linear and rotary motion to an elongated device, the method comprising:

rotating a main gear rotationally attached to a support and capable of being driven by a first drive;

engaging the elongated device along an axis of the elongated device's rotation in a linear drive, the linear drive coupled to the main gear, such that when the main gear is rotated,

the elongated device is rotated about the elongated device's axis of rotation, the linear drive being geared to a second drive, such that the linear drive imparts linear motion to the elongated device.

35. (Previously Presented) An apparatus for maneuvering of flexible catheters in the human cardiovascular system comprising:

a catheter manipulation device which supports at least one portion of the catheter including remotely controllable actuators, for transmitting to the catheter at least a longitudinal movement and/or rotary movement about its longitudinal axis;

a control and monitoring unit located in a remote position and protected in a shielded environment by means of which the operator can remotely control and monitor the operation of the catheter manipulation device which carries out the servo-controlled maneuvering of the catheter in the patient's body;

wherein the catheter manipulation device is configured to provide quick release of the catheter to permit the catheter to be manipulated directly by an operator independent of the catheter manipulation device.

36. (Previously Presented) The apparatus of claim 35 wherein the catheter is removably engaged with the catheter manipulation device through a slot extending away from the longitudinal axis of the catheter.

37. (Previously Presented) The apparatus of claim 36 wherein the catheter may be easily removed from the catheter manipulation device includes a pair of rollers that engage the catheter there between, the rollers being separably engaged to insert or remove the catheter.

38. (Previously Presented) The apparatus of claim 37 wherein all parts contacting the catheter are provided in a component designed for rapid and removable mounting to all of the actuators and means necessary for the remote operation of the apparatus.

39. (Previously Presented) The apparatus of claim 37 wherein the catheter manipulation device includes a transmission that is removably coupled to a motor and encoder for remote control of movement of the catheter.

40. (Previously Presented) An apparatus for the maneuvering of flexible catheters in the human cardiovascular system, characterized in that it comprises: means, in the form of an arm for example, for positioning, aiming and correct orientation with respect to the patient of a device for remote manipulation of the catheter; a device which supports at least one portion of the catheter and which comprises remotely controllable actuators, for transmitting to the said catheter at least a longitudinal movement of advance or withdrawal and/or a rightward or leftward rotary movement about its longitudinal axis; a control and monitoring unit located in a remote position and protected in a shielded environment, by means of which the operator can remotely control and monitor the operation of the said device which carries out the servo-controlled maneuvering of the catheter in the patient's body; means for the operational remote connection of the said servo-controlled device to the said control and monitoring unit.

41. (Previously Presented) The apparatus according to claim 40, including means which, in response to a remote command from the said control unit, can execute a controlled forward or backward longitudinal movement and if necessary a rightward or leftward rotation of the guide present in the catheter to facilitate and correct the advance of the said catheter in the patient's body.

42. (Previously Presented) The apparatus according to claim 40, in which all the parts intended to come into contact with the catheter and with any corresponding guide are provided in a component designed for removable mounting on a box which contains all the actuators and means necessary for the operation of the said apparatus by remote control.

43. (Previously Presented) The apparatus according to claim 40, in which the catheter manipulation device comprises a pair of rollers which are opposed, parallel to each other and orthogonal to the catheter, or equivalent means which enclose the catheter in a sufficiently well

distributed way; additional means being provided for transmitting to the said rollers a rotary movement about their axes for moving the catheter longitudinally forwards or backwards or for transmitting to the said rollers a movement of rotation or revolution about the longitudinal axis of the catheter, to rotate the said catheter about its axis to the right or to the left.

44. (Previously Presented) The apparatus according to claim 43, wherein the some of the rollers are mounted statically and in a projecting way on a support wall and are connected to a source of rotation, while the rollers opposite the static ones are mounted so that they can oscillate on the support wall in order to grip the catheter by friction, to enable them to act on catheters of different diameters and to enable them to be moved away as necessary from the static rollers whenever the catheter has to be inserted between the said movement rollers or withdrawn therefrom, suitable means being provided to facilitate this movement away.

45. (Previously Presented) The apparatus according to claim 43, in which means are provided for enabling the catheter to be rapidly released at any time from the opposing manipulation rollers, and also from the apparatus, in such a way that it can be controlled freely and directly by the operator.

46. (Previously Presented) The apparatus according to claim 45, wherein the device includes a slot channel into which can be inserted the free rear portion of the guide of the catheter, which is gripped between a pair of parallel driving rollers sprung with respect to each other and provided with a temporary opening device for the insertion of the guide between them and its extraction therefrom.

47. (Previously Presented) The apparatus according to claim 43, characterized in that the catheter is of the steerable type, and the said apparatus comprises means driven by remotely controllable actuators, also housed in the box containing the drive equipment, these actuators guiding the said catheter by transmitting to the tip and to the body of the said catheter the necessary bending and/or rotation to reach the desired position within the cardiovascular system.

48. (Previously Presented) The apparatus according to claim 40, in which means for measuring important physical parameters of the patient being treated are also provided in the remote shielded station from which the operator operates with the remote control and monitoring unit of the said apparatus.

49. (Previously Presented) The apparatus according to claim 40, in which a rechargeable electrical battery for the autonomous operation, if necessary, of the said apparatus can be mounted in the box or in another suitable position.

50. (Previously Presented) The apparatus according to claim 40, characterized in that, if the catheter has an internal guide the robotic apparatus is provided with two maneuvering units each of which can transmit rightward or leftward rotary movements and/or longitudinal forward or backward movements to the catheter and to the guide.